

REMARKS

Claims 1, 2, 4-7, 14-20, 25-27 and 29-32 remain pending in the present application. The claims have not been amended in response to the office action.

REJECTION UNDER 35 U.S.C. § 103

Claims 1, 2, 5-7, 14-16, 18-20, 25, 26 and 30-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomas (U.S. Pat. No. 6,697,642). Claims 4 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomas and Hottinen in view of Thomas (U.S. Pat. No. 6,498,939). Claims 17 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomas and Hottinen in view of Tiedemann (U.S. Pat. No. 6,396,867). Applicant respectfully traverses this rejection. As stated by the Examiner, Thomas fails to teach that the feedback information includes relative strength information regarding a first signal with respect to a second signal.

The Examiner then looks to Hottinen which the Examiner states teaches information regarding a first signal with respect to a second signal (col. 6, lines 12-45). However, Hottinen does not disclose, teach or suggest a relative strength between a first and a second signal, Hottinen teaches only a phase difference between two separated signals simultaneously received from different antennas. Claims 1, 14, and 25 define a relative strength information.

Hottinen is directed to achieving optimum coherence of signals received at one antenna (located at a mobile station (MS)) that were transmitted from multiple antennas (located very close together at a base station (BS)). This is accomplished by sending

feedback from the mobile station to the base station using the feedback to control the phase of the transmit antennas. The feedback consists of phase difference values.

The background of Hottinen discloses (1) how to achieve a directional antenna by using two or more antennas with relative phases between the antennas and (2) that STD and TxAA modes send feedback information in the form of a control value that is absolute (e.g. which antenna to use, the phase difference to use, the power balance to use) as opposed to a measurement value that is relative (i.e. differs in two respects: control vs measurement and absolute vs relative).

WCDMA/UMTS Transmit Diversity Modes (no receiver diversity)

Mode	Feedback Information	Total bits	Bits per time slot	Feedback rate [bps]	Constellation [phases]
STD*	"best" antenna to use	1	1	1500	2
TxAA mode 1**	Antenna Phase Difference to use	2	1	1500	4
TxAA mode 2**	Antenna Phase Difference, to use, Antenna Power to use	4	1	1500	8

* Selective Transmit Diversity (STD)

** Transmission Antenna Array (TxAA0)

The Hottinen specification then discloses determining a phase difference between two antennas and multiplexing two phase differences (from alternating quantization schemes). The former is relevant for the office action rejections. The

phase difference is the difference between two the phase of two signals received at one antenna at the same time from different transmit antennas. It is not the difference in strength between two signals over time (relative strength). These differ in two respects: (1) difference in phase not strength (power), and (2) between signals over time and not two separate signals.

The method of Hottinen improves the resolution of the phase differences (without decreasing the feedback channel signaling capacity) by alternating the scheme used to quantize the phase difference values. In particular, every second feedback value (phase difference) is generated using the rotated channel estimate instead of the unrotated channel estimate so the set of quantization values are offset by 45 degrees.

Thus, while Hottinen teaches feedback with phase different values, the present invention in Claims 1, 14, and 25 teaches feedback with relative strength information regarding a first signal with respect to a second signal.

Thus, Applicant believes Claims 1, 14 and 25 patentably distinguish over the art of record. Likewise, Claims 2, 4-7, 15-20, 26, 27 and 29-32 which ultimately depend from Claim 1, 14 or 25 are also believed to patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested.

CONCLUSION


It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office

Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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